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# COMPLETE SPECIFICATION

(ORIGINAL)

## FOR OFFICE USE

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## TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled: LOAD BEARING ARTICLE.

The following statement is a full description of this invention, including the best method of performing it known to me:—

\*Note: The description is to be typed in double spacing, pica type face, in an area not exceeding 9 1/2" in depth and 6 1/2" in width, on

This invention relates to load bearing articles and to methods of making them.

According to the present invention a method of making a load bearing article includes covering a light expanded plastics material having a low strength with a stronger plastics material.

The low strength material may be an expanded material and the covering material may comprise a mixture of substances basically similar to the constituents of the expanded materials but in different proportions so as to permit a much smaller degree of expansion to be obtained. The expansion obtained may be contained so as to make the covering compact while yet an increase in the strength and robustness of the product, combined with a more compact and better surface finish is obtained.

The application of the covering material may be effected in a second stage after having expanded the body or core of the product which it is desired to produce, as a coating on the latter.

Many different expanded materials are available such as polystyrene, polyurethane, PVC, expanded rubber and the like, in the form of rigid or flexible products, or with closed or open pores, these materials being used chiefly for filling or for giving the articles particular properties such as lightness, adequate installation and the like, together with small resistance to mechanical forces, solvents and the like.

When an article is covered as described above the resultant article will have an improved strength. Its external surface appearance may be changed completely and yet the article can be made compact, rigid or flexible depending on specific requirements. A compact surface can be obtained with an expanded material by restricting the enclosures, but the

result is not such as to make the articles sufficiently attractive as regards economy compatible with adequate strength properties.

Alternatively the article may be coated and its mechanical strength increased subsequently by the introduction of the reinforcing coating material into recesses, grooves, and the like, suitably arranged previously in the expanded material or produced subsequently before the application of the coating material which in this case will enter such recesses or grooves to achieve the object of increasing the mechanical strength subsequently.

It would of course be possible with this method to produce multi-layer articles since the reinforcing coating material can also be used as a connecting material.

If it is necessary to obtain subsequent mechanical strength in the part or article greater than that which can be obtained by using the reinforcing-coating or connecting material, it is possible to insert or interpose a suitable skeleton or framing material. Such framing or skeleton material will of course be incorporated wholly or partly in the connecting or coating material.

The part or article thus produced will have a very high finish and good strength properties, with a much lower production cost than could be obtained with the use of materials and methods already known.

The invention involves producing an article from expanded material and then coating it and possibly connecting several parts with this operation since the coating material is also a joining agent.

Since this material can be worked, adjusted, welded, etc. of course semi-finished products may be made therefrom and

then connected, adjusted, fitted, etc. as desired.

5 This reinforcing coating material may be obtained by mixing and directly applying in the cold state polyols and isocyanates such as, for example, polyesters or polyurethane substances. The proportions of catalysts, accelerators, retarding agents, pigments etc. will vary depending on the desired strength, finish, colour etc. The material may be applied by atomising (spraying) or by similar methods of a suitable type with the reaction in the spray. A suitable pressure will be about 6 kg/cm<sup>2</sup> with a polyol/isocyanate ratio of 1:1 to 4:1 with suitable use of accelerators, retarding agents, pigments, etc.

5 This mixture gives in the cold state a polyurethane plastics material which polymerises and solidifies to leave a perfectly smooth surface. The polyurethane plastics material also acts as a binding agent.

The expanded material substrate may constitute the basic material for achieving weight reduction or thermo-acoustic insulation or other functions.

) The skeleton or framing which may be provided may be constituted by glass cloth, pieces of wood and any suitable material used for this kind of purpose in the construction of plastics materials, such as, for example, reinforced polyesters.

This method permits the production of parts, articles, panels, etc. which are light and have a very high mechanical strength and robustness, a homogeneous and continuous structure, resistance to electrical current, water, sunshine, atmospheric deterioration, acids, oils etc.

The article produced may subsequently be pressed, vibrated, centrifuged to give it some particular characteristic. The

articles may be used in many different kinds of situation such as in buildings, ships, motor vehicles, housing, to take the place of materials having a heavier load-bearing structure and which are more expensive and more easily damaged.

The claims defining the invention are as follows:\*

- ( 1. A method of making a load bearing article by covering a light expanded plastics material having a low strength with a stronger plastics material.
- ( 2. A method as claimed in claim (1) in which the article is reinforced internally or externally by an internal accelerator or an external framework of the stronger plastics material.
- ( 3. A method as claimed in claim (1) or claim (2) in which the covering is applied in a liquid or semi-liquid state.
- ( 4. A method as claimed in claim (3) in which the covering material is applied by spraying or brushing.
- ( 5. A method as claimed in claim (3) in which the article is dipped in the covering material.
- ( 6. A method as claimed in any of the preceding claims in which the plastics materials are polyols and isocyanates which give a polyurethane plastics material.
- ( 7. A method as claimed in claim (6) in which the polyol isocyanate ratio is from 1:1- to - 4:1.
- ( 8. A method as claimed in claim (6) or claim (7) in which the plastics material includes a catalyst and / or an accelerator and / or a retarding agent and / or a pigment.

Dated this 25 day of OCT., 1974

AFRICO DALLAMORA

NAME OF APPLICANT  
(BLOCK LETTERS)

\*Note: If there is insufficient space above to type the statement of claim, do not use this sheet, but use separate sheets of paper beginning with the words "The claims defining the invention are as follows:" and ending with the date and the